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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/520,406	01/06/2005	Mitsuaki Iwashita	KKH-0034	5490

23353 7590 11/27/2007  
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EXAMINER
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MACARTHUR, SYLVIA

ART UNIT	PAPER NUMBER
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1792

MAIL DATE	DELIVERY MODE
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11/27/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/520,406	Applicant(s) IWASHITA ET AL.	
	Examiner Sylvia R. MacArthur	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 28 August 2007.  
 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,4-6,8-13 and 17-24 is/are pending in the application.  
 4a) Of the above claim(s) 21-24 is/are withdrawn from consideration.  
 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
 6) ☒ Claim(s) 1,4-6,8-13 and 17-20 is/are rejected.  
 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
 10) ☒ The drawing(s) filed on 06 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) ☒ All b) ☐ Some \* c) ☐ None of:  
 1. ☒ Certified copies of the priority documents have been received.  
 2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
 \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>1/6/2005</u> <u>12/28/2005</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election of claims 1, 4-6, 8-13, and 17-20 in the reply filed on 5/25/2007 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Applicant fails to explicitly state the basis on his stance that the inventions are linked to form a single general inventive concept under PCT Rule 13.1.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 4-6, 8-11, 13 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mathuni (US 5,945,351) in view of Sato (US 5,993,547).

Regarding claim 1: Mathuni teaches a processing apparatus for processing a substrate on a surface of which a film is formed, comprising: a film removing member (chambers 3 and 5) or selectively removing the film on a predetermined portion of an outer peripheral part of the substrate; said film removing member having a shape which is composed of a vertical part, an upper part formed in a horizontal direction from an upper end part of the vertical part, and a lower part formed in a same direction as the horizontal direction from a lower end part of the vertical part, being formed so that the outer peripheral part of the substrate is allowed to be inserted into an opening which is formed by the upper part and the lower part, and including a plasma supply part for supplying plasma of a reactive gas to the film on the predetermined portion and a suction port (gaps 22, 23) for sucking an atmosphere in a vicinity of the predetermined portion from outside the substrate, and said plasma supply part (gas inlets 7) being attached to a ceiling surface inside said film removing

member surrounded by the vertical part, the upper part, and the lower part see Figs 1 and 2. Plasma is discussed in col. 4 lines 50-54.

Mathuni fails to teach a rotating mechanism for rotating the substrate.

Sato teaches an edge rinse mechanism with a chuck 3a that rotates using rotating motor 3c. The motivation to rotate the wafer is that rotation is known in the art to enhance the speed and uniformity of treatment. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to rotate the substrate.

Claim 4. The processing apparatus as set forth in claim 1, wherein said suction port is provided inside said film removing member and at a position facing the opening, see Figs. 1 and 2 of Mathuni.

Claim 5. The processing apparatus as set forth in claim 1, wherein said plasma supply part is provided in a portion facing the predetermined portion in said film removing member, and said suction port is provided outside said plasma supply part, see Figs. 1 and 2 of Mathuni.

Claim 6. The processing apparatus as set forth in claim 5, wherein said plasma supply part is provided in a portion facing the predetermined portion in said film removing member, and said suction ports are provided facing to each other with said plasma supply part therebetween. Note there are three plasma supply parts taught by Mathuni the gas inlets 7 and the plasma generating chamber 25 which is located between suction ports 22, 23.

Regarding claim 8: Mathuni fails to teach the processing apparatus as set forth in claim 1, further comprising: a horizontal driving part for horizontally moving said film removing member. Sato teaches the horizontal movement of resist exfoliating agent 6 with element B see Fig. 3 and col. 5 lines 10-35. The motivation to allow for the displacement of the nozzle is that it allows for better control of the treatment location. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to allow for movement of the treatment nozzle, see also Fig. 4 of Sato.

Regarding claim 9: Mathuni fails to teach the processing apparatus as set forth in

claim 1, further comprising: a controlling part for controlling a suction pressure of said suction port. Sato teaches the use of a suction pump 8b and controller 8c to control the suction pressure according to col.5 lines 36-45 this control allows for an optimum exhausting sequence and an optimum exhausting pressure which are able to prevent the removed material from being bound to the substrate. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to provide the controlling part as taught by Sato.

10. The processing apparatus as set forth in claim 1, wherein said plasma supply parts are provided at plural positions along a radial direction of the substrate in said film removing member. See Mathuni teaches baffles 18, 20 and Sato teaches a plurality of gas supply nozzles.

11. The processing apparatus as set forth in claim 1, wherein said plasma supply parts are provided at plural positions along a circumferential direction of the substrate in said film removing member. See Mathuni teaches baffles 18, 20 and Sato teaches a plurality of gas supply nozzles.

13. The processing apparatus as set forth in claim 10, wherein said film removing member further includes a reactive gas jetting part for jetting the reactive gas. See Figs. 1 and 2 of Mathuni.

Regarding claim 17. Mathuni fails to teach the processing apparatus as set forth in claim 1, further comprising: a removal solution discharge nozzle for discharging a removal solution to the outer peripheral part of the substrate to remove the film on the outer peripheral part, in addition to said film removing member. The modification of Mathuni with the apparatus of Sato would provide this additional solution discharge nozzle. Both the prior art of Mathuni and Sato solve the problem of etching the edge of a substrate using discharge nozzles and suction. It would be a matter of obvious design choice to modify the apparatus of Mathuni with Sato to provide two nozzles as recited to enhance and optimize the treatment of the substrate edge. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to modify the apparatus of Mathuni with Sato to provide two nozzles as recited to enhance and optimize the treatment of the substrate edge.

Regarding claims 18 and 19: These claims are interpreted as matter of an intended use

and do not structurally limit the prior art of Mathuni. Further note that Mathuni does teach these uses see the abstract and col. 4 lines 45-54.

4. Claims 12 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mathuni (US 5,945,351) in view of Sato (US 5,993,547), as applied in claims 1, 4-6, 8-11, 13 and 17-20 above, in further view of Sadohara et al (US 2001/0032705).

The teachings of Mathuni were discussed above.

Regarding claim 12: Mathuni fails to teach the processing apparatus as set forth in claim 1, wherein said plasma supply part is an emitting part of a ray for converting the reactive gas into the plasma. The abstract of Sadohara et al teaches plasma generator 1 to form a reactive gas using a microwave generator M. Note that Mathuni also teaches a microwave generator. The use of rays is an alternative means of generating plasma. Such as using UV rays see [105] of Sadohara et al. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to modify the apparatus of Mathuni as modified by Sato with a suggestion to use alternative plasma generating means.

Regarding claim 20: Mathuni fails to teach the processing apparatus as set forth in claim 1, further comprising: a heating unit for heating the substrate by an infrared ray.


Sadohara et al teaches a local etching wherein a substrate is heated using IR see paragraph [0016] and [0021]. Sadohara et al teaches that it is conventional to heat the substrate during treatment in order to ensure that it remains at optimal temperature. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to modify the apparatus of Mathuni as modified by Sato with the IR heater of Sadohara et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sylvia R. MacArthur whose telephone number is

571-272-1438. The examiner can normally be reached on M-Th during the hours of 8 a.m. and 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Sylvia R MacArthur  
Primary Examiner  
Art Unit 1792

November 26, 2007